

HIGHER TECHNICAL INSTITUTE CIVIL ENGINEERING DEPARTMENT

**ANALYSIS AND DESIGN OF A STRUCTURAL STEEL UNBRACED
BUILDING**

C/995

**By
ELENA BAKALIAOU**

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Chapter 1: Introduction

Steel design is being using more and more in Cyprus in the last years, for warehouses, factories but less for houses. The analysis is the same as in concrete – brick houses, which are widely used in Cyprus. The analysis and design steps are always done by the help of a program use.

Since the pass of time the use of computer has become more and more necessary in all professional circles. Using computer programs can save much time which is money and also many difficulties be solved this way.

In Civil Engineering Department are the high degrees of programs widely used. These programs may vary from the very simple ones, such as Domus, to the highly complex but flexible ones, such as STAAD.

When STAAD Pro. is used for the first time it may seem to be a very difficult program, however on frequent use it becomes easier and the user discovers simple ways for him to use, as user from user differ in their way of working i.e. all the data can be given direct from the editor (input data for the problems) or all the data could be given from the toolbars shown on screen, and of course those are transferred to the editor.

Once the data of a problem are given, and the analysis follows, the designer must then check if the results are valid. Unless the above measures are taken, the designer must in no case trust the program . It makes the process faster and easier for the analysis of a project but on the other hand the designer has to know the proper checks he has to do in order for the design to be safe and economical.

In order to get familiar to the program, we solved some training examples in the program and then by hand to see that the program was working properly. I solved some simple bending problems and some axial problems and I compared the results. However, the solution of a project was still something strange for me.

After the solution of those training examples, the searching of an unbraced structure started.

When the proper structure was found, a house which was constructed during that period, the design of it was followed. The design of beams and columns was done using Universal beams of different sections. The sections were changed many times in order to find the most efficient.

Finally, the analysis was done with the most efficient structural elements. The program STAAD was very helpful in the step of analysis because it save a lot of time and therefore money, as was stated above, which are the most important factors, after safety of course, which a designer take into consideration in analysis and design step.

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